

# THE SOLAR PHYSICS OBSERVATORY ECLIPSE EXPEDITION.

Innsbruck, September 12.

SINCE my last letter, which was dated August 26, I have had so little time for writing that I take the first opportunity to record the events that followed

It was not long, however, before many of us reached our camp. Rain had fallen about 4 a.m., and at about 6 a.m. another shower helped still further to lay the dust, which had proved such a menace to the smooth working of the clocks. The previous evening all dark slides had been carefully filled and noted with their particular make of plates, and these now were distributed to the different workers.

Fortunately we were working in an area enclosed by a wall, so that only those who had received special permission could enter. Needless to say, invitations were numerous, and included the majority of those who had helped us in various directions during our preparations.

At the time of first contact, clouds near the region of the sun were very few, and we observed this under excellent conditions. As time progressed, a great bank of clouds was seen gradually working its way along from the west, and it became a race between the clouds and the moment of second contact, i.e. the beginning of totality. The diminishing cres-

cent became smaller and smaller at about the same rate as the clouds over the sun became thicker and thicker. The clouds won! The moment of second contact could not be observed! We went, however, through our programmes, knowing that we were photographing nothing. Venus became a brilliant object in the west seen through a break.

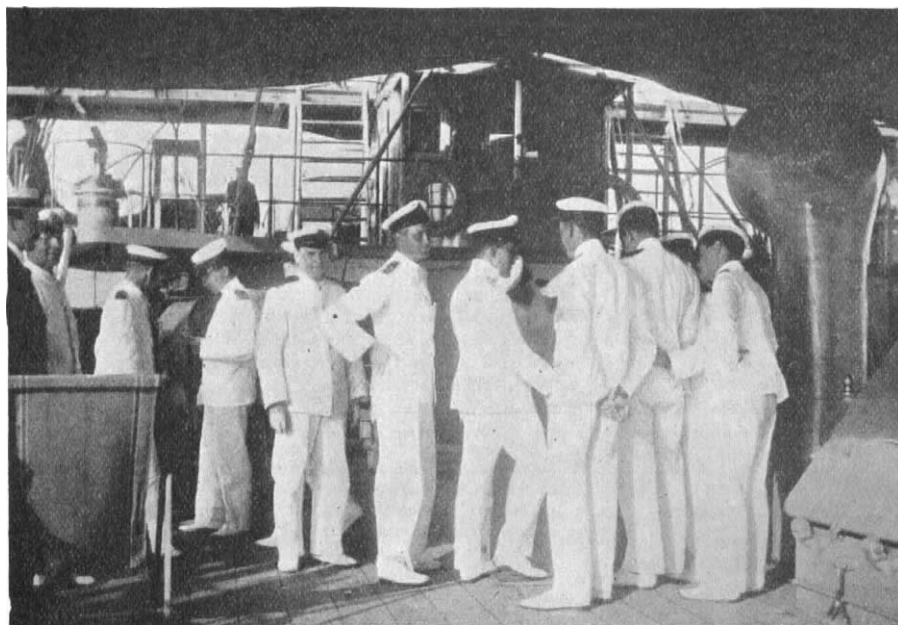
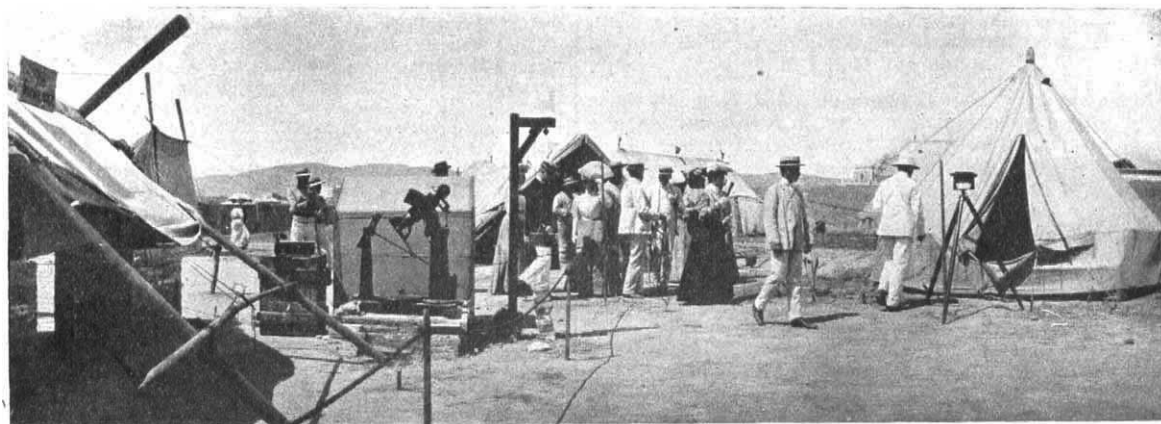


FIG. 1.—The officers of H.M.S. *Venus* volunteering for eclipse work on the quarter-deck.

the last communication. Passing over August 28 and 29, which were spent in giving the final touches to the various instruments, putting in the eclipse mirrors, and in rehearsing, we come to the eclipse day itself. Turning out at 5 a.m. and scanning the sky, a glance showed that clear weather conditions for eclipse time were very doubtful. Heavy black clouds



6-inch prismatic camera.

16-feet coronagraph tent.

The tent of Lieut. Horne (Commandant of Camp) and myself.

FIG. 2.—Visitors being shown round the camp on the day before the eclipse. Looking west.

were sailing majestically across the zenith, and still blacker ones were slowly moving nearer the horizon. There were, however, small breaks here and there where blue patches were exposed for brief intervals, but it seemed that the chances for a clear eclipse were very small.

Fortunately there were two currents of air at work in the upper regions, one coming from the south and the other from the west. This intermingling of currents was possibly the cause of the thinning of the clouds over the sun, and gave us a view of the corona for brief intervals through, as it were, a thin

veil; the clearest intervals were towards the end of totality. The burst of sunlight from the north-west limb of the sun heralded the end of totality, and thus ended the work of the instruments and the greater majority of the different parties.

We were all, however, bitterly disappointed. So much trouble had been taken to make everything work with the maximum of efficiency, but, alas! with so

the poles. At the north pole there was a region displaying the beautiful rifts seen at best during eclipses at a minimum stage, but at the southern pole no such distinctive structure was seen. Unfortunately the eastern and western limb of the sun were shrouded in thicker haze than the north and south region at the time that I had my longest glance. It was therefore about the solar poles that the longest streamers



Mr. F. McClean.

De la Rue coronagraph  
behind the men.Grating  
spectrograph.Mr. Howard  
Payn.

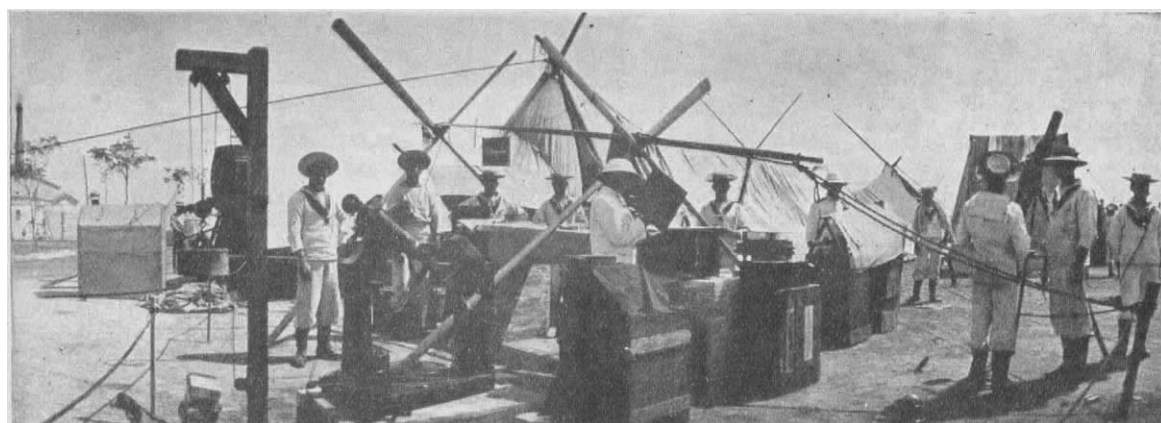
FIG. 3.—Taken after the beginning of first contact. The tents over the instruments have all been removed. The 16-feet coronagraph, with Mr. F. McClean and his naval staff.

small a result. Prismatic cameras of high dispersive power and prismatic reflectors of long focal length, to say nothing of long-focus lenses for three-colour negatives, are not conducive to good results in a cloudy sky!

During the few moments that were available between the exposures of the different plates in my instrument I saw enough of the corona to know what a magnificent sight it would have been had it been

were seen by me, and two in the south-east quadrant extended for at least two solar diameters.

The eclipse being over there was then nothing more to do than to collect all the photographic plates exposed and commence with the packing up of the instruments. It is one thing to set up the instruments and another to take them down. By the evening of the same day about 50 per cent. of the packing up had been completed.



Siderostat.

Tube of 6-inch  
prismatic camera.Packing cases supporting  
small cameras with gratings.Cusp  
telescope.Three-colour camera  
in distance.

FIG. 4.—The 6-inch prismatic camera, showing staff and positions for the small grating cameras and the cusp telescope.

seen in a cloudless sky. The enormously brilliant red prominence in the north-east quadrant was an undoubted feature of this eclipse, and nothing like it was seen by me in either the 1898 or 1900 eclipses. From several accounts the landscape was illuminated by this red radiating object, and sunset effects were recorded by other observers.

The corona itself was of the maximum type, streamers radiating in all directions even very near

In the cool (?) of the evening the development of the plates was commenced. Those which promised to have some kind of record on them were taken first. To sum up the results, now that the whole set has been developed, it may be said that we have been far more fortunate than was at first anticipated. The prismatic reflector worked by Mr. Butler succeeded in securing an excellent picture of the lower corona, the solar diameter being about  $8\frac{1}{8}$  inches. The 16-feet



coronagraph operated by Mr. F. McClean obtained a fine photograph of the corona with excessively sharp detail and good extension. The De la Rue coronagraph in charge of Lieut. Trench, R.N., was fortunate enough to secure three negatives, all of which will be very serviceable, as the focus was so well adjusted. Unfortunately the long exposures required for the three-colour camera operated by Lady Lockyer could not be secured in consequence of clouds. The  $3\frac{1}{2}$ -inch Newton, mounted equatorially and worked by Staff-Surgeon Clift, obtained two successful exposures. The instrument in my charge secured four negatives that will prove useful, one of which displays the green coronal ring clearer than those which were secured in the 1898 or 1900 eclipses, and several other distinct coronal rings in addition. The spectrum of the lower chromosphere at the beginning or end of totality was not obtained. The objective grating spectroscope worked by Mr. Howard Payn produced one out of two exposures made, and shows the spectrum of the larger prominences and the green coronal ring.

The observers of the shadow bands gained a great

Committee. Perhaps by the time that the next eclipse occurs we may know a little more about "weather" to enable observers to go to regions where they will not be totally or even partially clouded out!

WILLIAM J. S. LOCKYER.

#### INTERNATIONAL METEOROLOGICAL CONFERENCE AT INNSBRUCK.

THIS International Meteorological Conference was opened at Innsbruck on September 9, when Dr. Hildebrandsson, the secretary of the International Meteorological Committee, read the report of the operations of that body on the part of M. Mascart (president) and himself, and explained that at the Southport meeting in September, 1903, Dr. Pernter's proposal that a conference of the directors of meteorological services should be held at Innsbruck this year, similar in character to those at Munich in 1891 and Paris in 1896, was favourably regarded and subsequently adopted.

The vacancies which have occurred on the committee from various causes have been filled by the

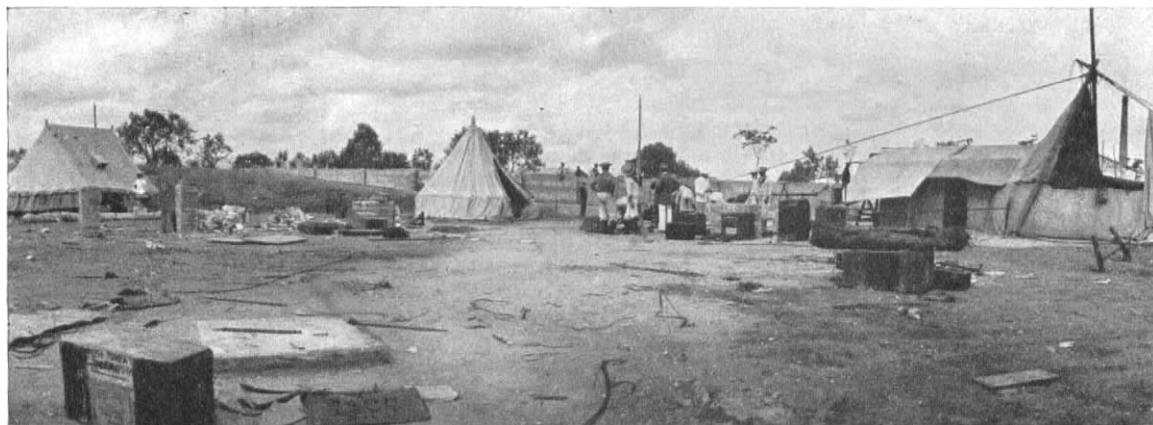
Officers tent.

Lieut. Horne's  
and my tent.

Group packing 6-inch  
prismatic camera.

Dark room.

72 feet prismatic  
reflector.



Pillars of 16-foot  
coronagraph.

$3\frac{1}{2}$ -inch Newton  
telescope base.

Base on which the three-colour  
camera was located.

FIG. 5.—The camp four hours after the eclipse, showing how quickly the instruments were removed.

amount of information as regards their size, rate of motion, and direction. The coronal sketches obtained very concordant results, and the other parties gleaned much useful information, which will be published later, as the observations have not yet been brought together.

By the evening of Sunday, September 3, the whole of the instruments, tents, dark room, and smaller huts were comfortably on board, and we steamed away to Palermo, leaving our camp as bare as we found it. Two copies of each negative had been made and separately packed to ensure loss against accident.

With the exception of Mr. Butler, who proceeded to Malta in H.M.S. *Venus*, and of Mr. Payn, who remained at Palma, our party bade farewell to the officers and men of H.M.S. *Venus* who had worked so hard, and whom Dame Nature had treated so badly. Crossing to Naples, where we left Mr. F. McClean, we took the train the same morning to Rome, and after a short rest and a little sight-seeing journeyed to Innsbruck, travelling through the beautiful Brenner Pass, to attend the meeting of the Solar Commission of the International Meteorological

appointment of Dr. Palazzo and Dr. Shaw in succession to Prof. Tacchini and Dr. Scott. Dr. Hildebrandsson was elected secretary on the retirement of Dr. Scott, who, since the creation of the committee, had performed this function with a zeal and devotion which would be most gratefully remembered. The following changes have also been made:—M. Chaves, director of the Meteorological Service of the Azores, was appointed in place of Admiral de Brito-Capello, Dr. Hellmann in succession to Prof. von Bezold, and M. Lancaster in succession to M. Snellen.

Sir John Eliot, having ceased to be director of the Indian Meteorological Service, tendered his resignation as a member of the committee, but, with the approval of the India Office, communicated through Dr. Shaw, the committee invited him to retain his seat, as representing in Europe the Meteorological Service of India. Thus the committee has the great advantage of counting among its members residing in Europe a man of experience and possessing a thorough knowledge of the meteorology of the tropics.

According to the report presented by M. Wild and Dr. Scott to the conference at Munich, and adopted